This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

Claim 1 **(Canceled)**

2. **(Previously Presented)** A heat sink of claim 22 wherein said fins and said foam blocks are connected to one surface of said heat spreader plate.

3. **(Currently amended)** A heat sink for electrical or electronic components comprising:

a heat spreader plate to which the components to be cooled are connected;

at least two heat conducting fins that are positioned substantially parallel to one another and which are connected substantially perpendicular to said heat spreader plate;

at least one foam block that is disposed in the space between parallel fins wherein said block is formed of reticulated foam to define a highly porous, heat conducting, open-celled structure that permits a cooling fluid to flow through said block as the cooling fluid passes across said fins; and

said at least one foam block being made from aluminum, copper, graphite, or aluminum-nitride ceramic ~~A heat sink of claim 1~~

wherein the fin height, **b**, is determined by the relationship,

$$\boldsymbol{b} = 0.6498\sqrt{\frac{k_f \delta_f}{h}}$$

where,

k_f is the thermal conductivity of the selected fin material, Btu/ft s °F

δ_f is the fin thickness, ft

h is the convective heat transfer coefficient for the foam-filled space bounded by said fins and said heat spreader plate, Btu/ft^2 s °F, and where h is given by the formula,

$$h = 1.2704\left[\frac{n^{0.50}}{(1-\phi)^{0.25}}\right]\left(\frac{\rho^{0.50}k^{0.63}c_p^{0.37}}{\mu^{0.13}}\right)u_m^{0.50}$$

where,

n is the linear density of said at least one foam block, pores per ft

ϕ is the porosity of said at least one foam block, expressed as a fraction

ρ is the density of the cooling fluid that passes across said fins, lb_m/ft^3

k is the thermal conductivity of the cooling fluid, Btu/ft s °F

c_p is the isobaric specific heat of the cooling fluid, Btu/lb_m °F

μ is the dynamic viscosity of the cooling fluid, lb_m/ft s

u_m is the mean velocity of the cooling fluid, ft/s

4. **(Currently amended)** A heat sink for electrical or electronic components comprising:

a heat spreader plate to which the components to be cooled are connected;

at least two heat conducting fins that are positioned substantially parallel to one another and which are connected substantially perpendicular to said heat spreader plate;

at least one foam block that is disposed in the space between parallel fins wherein said block is formed of reticulated foam to define a highly porous, heat conducting, open-celled structure that permits a cooling fluid to flow through said block as the cooling fluid passes across said fins; and

said at least one foam block being made from aluminum, copper, graphite, or aluminum-nitride ceramic ~~A heat sink of claim 1~~

wherein the fin spacing, **a**, is determined by the relationship,

$$\boldsymbol{a} = \Phi\delta$$

where,

Φ is between 1 to 6

δ, ft, is determined by the relation,

$$\delta = 7.32\sqrt{\frac{kc}{\rho\, c_p u_m}}$$

where,

c is the selected fin length in the flow direction, ft

k is the thermal conductivity of the cooling fluid that passes across said fins, Btu/ft s °F

ρ is the density of the cooling fluid lb_m/ft^3

c_p is the isobaric specific heat of the cooling fluid, $Btu/lb_m{}^{\circ}F$

u_m is the mean velocity of the cooling fluid, ft/s.

5. **(Currently amended)** A heat sink of claim [[~~1~~]] 3 wherein said heat spreader plate, said fins and said at least one foam block are made from the same or different thermal conducting materials.

6. **(Currently amended)** A heat sink of claim [[~~1~~]] 3 wherein said heat spreader plate and said fins are made from aluminum, copper, graphite or aluminum-nitride ceramic.

7. **(Currently Amended)** A heat sink of claim [[~~1~~]] 3 wherein said heat spreader plate and said fins are made from aluminum.

Claims 8 – 20: **(Cancelled)**

21. **(Currently amended)** A heat sink of claim [[~~1~~]] 3 wherein said fins and said at least one foam block are connected to one surface of said heat spreader plate.

22. **(Currently amended)** A heat sink of claim [[~~1~~]] 3 wherein said at least one foam block is further defined as a plurality of foam blocks.

23. **(Previously presented)** A heat sink of claim 22 wherein said fins are connected to said heat spreader plate through thermal bonding.

24. **(Previously presented)** A heat sink of claim 22 wherein said fins are connected to said foam blocks through thermal bonding.

25. **(Previously presented)** A heat sink of claim 23 wherein said fins are connected to said foam blocks through thermal bonding.

26. **(Currently amended)** A heat sink of claim [[~~1~~]] 3 wherein said fins are connected to said heat spreader plate through thermal bonding.

27. **(Currently amended)** A heat sink of claim [[~~1~~]] 3 wherein said fins are connected to said at least one foam block through thermal bonding.

28. **(Previously presented)** A heat sink of claim 26 wherein said fins are connected to said at least one foam block through thermal bonding.

29. (New) A heat sink for electrical or electronic components comprising:

a heat spreader plate to which the components to be cooled are connected;

at least two heat conducting fins that are positioned substantially parallel to one another and which are connected substantially perpendicular to said heat spreader plate;

at least one foam block that is disposed in the space between parallel fins wherein said block is formed of reticulated foam to define a highly porous, heat conducting, open-celled structure that permits a cooling fluid to flow through said block as the cooling fluid passes across said fins; and

said at least one foam block being made from aluminum, copper, graphite, or aluminum-nitride ceramic,

wherein the fin height, **b**, is determined by the relationship, and

$$\boldsymbol{b} = 0.6498\sqrt{\frac{k_f \delta_f}{h}}$$

where,

k_f is the thermal conductivity of the selected fin material, Btu/ft s °F

δ_f is the fin thickness, ft

h is the convective heat transfer coefficient for the foam-filled space bounded by said fins and said heat spreader plate, Btu/ft^2 s °F, and where h is given by the formula,

$$h = 1.2704\left[\frac{n^{0.50}}{(1-\phi)^{0.25}}\right]\left(\frac{\rho^{0.50} k^{0.63} c_p^{0.37}}{\mu^{0.13}}\right) u_m^{0.50}$$

where,

n is the linear density of said at least one foam block, pores per ft

ϕ is the porosity of said at least one foam block, expressed as a fraction

ρ is the density of the cooling fluid that passes across said fins, lb_m/ft^3

k is the thermal conductivity of the cooling fluid, Btu/ft s ^oF

c_p is the isobaric specific heat of the cooling fluid, Btu/lb_m ^oF

μ is the dynamic viscosity of the cooling fluid, lb_m/ft s

u_m is the mean velocity of the cooling fluid, ft/s and

a heat spreader plate to which the components to be cooled are connected;

at least two heat conducting fins that are positioned substantially parallel to one another and which are connected substantially perpendicular to said heat spreader plate;

at least one foam block that is disposed in the space between parallel fins wherein said block is formed of reticulated foam to define a highly porous, heat conducting, open-celled structure that permits a cooling fluid to flow through said block as the cooling fluid passes across said fins; and

said at least one foam block being made from aluminum, copper, graphite, or aluminum-nitride ceramic ~~A heat sink of claim 1~~

wherein the fin spacing, **a**, is determined by the relationship,

$$a = \Phi\delta$$

where,

Φ is between 1 to 6

δ, ft, is determined by the relation,

$$\delta = 7.32\sqrt{\frac{kc}{\rho\, c_p u_m}}$$

where,

c is the selected fin length in the flow direction, ft

k is the thermal conductivity of the cooling fluid that passes across said fins, Btu/ft s oF

ρ is the density of the cooling fluid lbm/ft3

cp is the isobaric specific heat of the cooling fluid, Btu/lbmoF

um is the mean velocity of the cooling fluid, ft/s.